



It is cheaper to drive a mile on electricity than it is to drive a mile on gasoline. Though your electricity costs will go up if you're charging your electric vehicle (EV) at home, your gas costs will decrease more. We've done some math to demonstrate cost savings and found that **New England EV drivers are saving 8.3 to 10.4 cents per mile** by driving on electricity instead of gasoline. If gas prices remain as high as they are now, savings will translate to **\$987 to \$1240 per year**.

Considered another way, a gas-powered car would have to get more than 49 MPG in MA or 65 MPG in RI to beat the cost savings of an electric vehicle... but the gas-powered car would still emit twice as much climate-warming gases and be vulnerable to fluctuating gasoline prices in the future.

To get an estimate for how much you will save switching to an electric car, replace the **numbers in red** with values that are specific to your electric bill or existing gas car, and then plug the same math into your calculator.

Electric cars save 8.3 to 10.4 cents per mile

How much does it cost to drive a mile on electricity?

The average new all-electric car available through the Drive Green program requires about [0.30 kilowatt-hours \(kWh\) per mile driven](#). One kWh costs about \$0.29 in Massachusetts and \$0.22 in Rhode Island (including supply, transmission, and distribution).

$$\frac{0.30 \text{ kWh}}{\text{mile}} \times \frac{\$0.29}{\text{kWh}} = \frac{\$0.087}{\text{mile}} = \text{cost to drive one mile on electricity in MA}$$

$$\frac{0.30 \text{ kWh}}{\text{mile}} \times \frac{\$0.22}{\text{kWh}} = \frac{\$0.066}{\text{mile}} = \text{cost to drive one mile on electricity in RI}$$

A natural gas shortage has increased electricity supply prices for the winter of 2022, but the surge in prices is temporary until May 2022.

How much does it cost to drive a mile on gasoline?

The average fuel efficiency of the vehicle fleet in the United States is [25.7 miles per gallon](#). The average retail gasoline price for all fuel grades in New England in 2022 as of 3/16/2022 was [\\$4.30 per gallon](#).

$$\frac{1 \text{ gallon}}{25 \text{ miles}} \times \frac{\$4.30}{\text{gallon}} = \$0.172/\text{mile} = \text{cost to drive one mile on gas}$$

How much do I save by switching from a gasoline-powered car to an all-electric car?

It costs 17¢/mile to drive a gas-powered car and 6.6-8.7¢ per mile to drive an all-electric car, so switching to an all-electric car saves the average Massachusetts or Rhode Island driver between 8.3 and 10.4¢ per mile, *not* including savings from maintenance (which can be as much as [3 ¢ per mile](#))

EV drivers will save \$987 to \$1240 a year if gas prices stay this high.

The average licensed driver drives 11,759 miles per year in Massachusetts and 12,781 miles per year in Rhode Island, according to the [Federal Highway Administration](#). We will use the weighted average of these numbers based on each state's population in 2018 for our analysis.

$$11,759 \text{ MA miles} \times \frac{6.89 \text{ million}}{7.92 \text{ million}} + 12,781 \text{ RI miles} \times \frac{1.06 \text{ million}}{7.92 \text{ million}} \\ = \mathbf{11,896 \text{ miles driven annually}}$$

Since switching from a gas-powered car to an all-electric car saves the average Massachusetts or Rhode Island driver 8.3 – 10.4 ¢ per mile. If those savings continue because gasoline stays around \$4.30 for a while, savings could amount to **\$987 - \$1240 per year**.

How many miles per gallon would a new gas-powered car have to get to be cheaper per mile than the average new electric car?

Hybrids, like the Toyota Prius, are more efficient gas cars. But not even the most efficient gas-powered cars can't be the savings of an EV. Assuming a gas price of [\\$4.30/gallon](#), a car would need to get over 49 miles per gallon in MA and 65 miles per gallon in RI to be cheaper to fuel than an all-electric car.

$$\frac{\$4.30}{\text{gallon}} \times \frac{1 \text{ mile}}{\$0.066} = 65 \frac{\text{miles}}{\text{gallon}} \text{ to beat an EV in RI}$$

$$\frac{\$4.30}{\text{gallon}} \times \frac{1 \text{ mile}}{\$0.087} = 49 \frac{\text{miles}}{\text{gallon}} \text{ to beat an EV in MA}$$

(Cost of a gallon of gas / cost of a mile on electricity = MPG required for a gas-powered car to be more cost-effective than an EV)

How does the cost of electricity compare to the cost of a gallon of gasoline?

The [Department of Energy](#) has developed a methodology to compare the cost of electricity to the cost of gasoline on an apples to apples basis. The eGallon allows you to quickly gauge how cheap gasoline has to become in order to beat the savings of an EV.

$$\text{eGallon } (\$/\text{gal}) = \text{FE} * \text{EC} * \text{EP}$$

- FE= average fuel economy for passenger cars (miles per gallon)
- EC=average efficiency for electric cars (kilowatt-hours per mile)
- EP= typical cost of electricity (\$ per kilowatt-hour)

$$\text{MA eGallon} = \frac{30 \text{ miles}}{\text{gallon}} * \frac{0.3 \text{ kWh}}{\text{mile}} * \frac{\$0.25}{\text{kWh}} = \$2.25$$

$$\text{RI eGallon} = \frac{30 \text{ miles}}{\text{gallon}} * \frac{0.3 \text{ kWh}}{\text{mile}} * \frac{\$0.22}{\text{kWh}} = \$1.98$$